AMERICAN BEE JOURNAL.

PUBLISHED BY A. M. SPANGLER & CO., 25 NORTH SIXTH ST., PHILADELPHIA.

VOL. I. MAY, 1861. No. 5.

The Dzierzon Theory.

BY THE BARON OF BERLEPSCH.

No. V.

The next proposition to be examined, is—

6. In the act of copulation the genitalia of the drone enter the vulva of the queen, are there retained, and the drone simultaneously perishes.

This was in substance the view held by Huber, and rejected as ridiculous or absurd by Spitzner and others, then and since. It is unnecessary now to recapitulate Huber's experiments and reasoning, because we have, in addition, recent and positive evidence that his surmise was well grounded. Queens have, in numerous instances, been seen returning from their hymeneal excursions, with the evidence of copulation protruding from the vulva, as a white threadlike substance. This has commonly been regarded as the penis of the drone, but is, in reality, only a fragmentary portion of the seminal duct adhering to the severed genitalia. Conjecturing this, I resolved to have the facts ascertained by procuring the dissection of a queen caught on her return. On the 23d of July, 1853, I had an opportunity to secure one whose vulva was distended by a white mass seemingly firmly wedged in, showing that a severance of the entire sexual apparatus of the drone had taken place. I immediately immersed her in diluted alcohol, and sent her to Prof. Von Siebold, who has published the following account of the result of his investigation.

"I was struck, at the first glance, by the fact that the orifice of the vulva of this queen was widely distended, having a clearly defined substance protruding—two yellowish horns, curved upward, being particularly prominent. I soon satisfied myself that this substance was not an extruded portion of the intestines, for, by careful manipulation with a pincette, I succeeded in extracting it from the vulva. On examining it with a microscope, I found I had before me the severed sexual apparatus of a male bee. The two yellowish horns were simply those two curved and pointed *cul-de-sacs*, which a slight pressure on the abdomen of a drone causes to spring forth, resulting in his death. Between these horns was a dark brown body projecting into the vulva, which I recognized as the penis of the drone. It was hence evident that I had before me a queen bee, in whose vulva the detached sexual organs of the male bee remained inherent, after copulation."

It would be superfluous to add anything to this decisive evidence, in support of the first portion of the proposition; nor need I undertake the formal demonstration of the second. That the act of copulation involves the death of the drone, is well known to all experienced beekeepers. The extrusion of the genitalia of a drone, by however slight and gentle pressure effected, invariably results in his immediate death. This may be surprising to all, and incredible to many; but the ascertained fact is all that now concerns us. It is not incumbent on the observer to assign any reasons for it.

While on this topic, I may state that I conceive that, for effecting copulation, the queen must possess the free and full use of her hinder legs—though the special necessity of this is not apparent, except from circumstances. Dzierzon states that a virgin queen, crippled from her birth in one of her hinder legs, remained sterile after making numerous excursions while drones abounded. I had the curiosity to verify the fact, by mutilating the hinder legs of a young queen before fecundation, and though I saw her fly out frequently afterwards, she never became fertile.

It has also been supposed that the queen employs her hinder legs, in ridding herself of the dead drone, after copulation. But if this be so, it is still manifest from Dzierzon's observation and my experiment, that this is not the sole nor the primary use she makes of them on the occasion.

I will now take up the next proposition:

7. The fecundation of the queen, once accomplished, is efficacious during her life, or so long as she remains healthy and vigorous; and when once become fertile, she never afterwards leaves her hive, except when accompanying a swarm.

Since it has been shown that the fecundation of the queen is always effected outside of the hive, and fertile queens with defective wings are known to live several years, (I had one that survived five years after losing her wings,) though the colony continues in a prosperous condition all the time, it is evident that, ordinarily at least, fecundated queens do not again leave their hives except to accompany a swarm. But may not occasional exceptions occur? Were all those mistaken or deceived, who declare that they saw *fertile* queens issue in the spring and at other seasons, though no swarm left? They certainly were mistaken; and I beg those who may hereafter see a supposed fertile queen issue under such circumstances, to make an immediate examination of the colony. I can assure them they will in no instance find either eggs or brood in the cells; or if brood be found, it will be such only as is sealed and nearly mature.

But the question assumes a different aspect when we inquire, whether fecundated queens, *which have not yet begun to lay eggs*, do not occasionally repeat their excursions? To such an inquiry, I must explicitly reply in the affirmative? Two cases came under my own observation (one in 1843, and the other in 1849,) where young queens which I had seen returning with the marks of copulation, did subsequently issue again—the one on the same day, the other on the day after. I also saw each of these return from her second excursion; but neither of them displayed evidence of renewed fecundation. Dzierzon also observed a queen issuing a second time, under similar circumstances. We may therefore dismiss this, and proceed to the next proposition.

8. The ovaries of the queen are not impregnated in copulation; but a small vesicle or sac which is situated near the termination of the oviduct, and communicating therewith, becomes charged with the semen of the drone.

"What a preposterous and ridiculous hypothesis!" So exclaim, not I, but others; though I candidly confess that, when I first heard this doctrine announced, I was exceedingly incredulous. It was only after long hesitation and study, yielding gradually and very slowly to the evidence of undeniable facts, that I became a convert. Even then I assented to it as an hypothesis *to be accepted only for the time;* first, because neither others nor I could offer anything better; secondly, because by it all the mysteries otherwise inexplicable, were solved; and thirdly, because many isolated facts corroborated it.

I reasoned thus: Since uniform experience shows that young queens with defective wings never become qualified to lay *worker* eggs, and that healthy young queens, able to fly, become so qualified only when drones exist, it is clear that fertilization qualifying them to lay such eggs, is effected exclusively outside of the hive. Now, as we further know from experience that queens sometimes emerge from the royal cells with crippled wings, and do yet in exceptional instances lay eggs from which drones are developed, we have only this alternative—either to conclude that such queens lay drone-eggs without having been fecundated; or that fecundation, if occurring within the hive, is inefficient. We might be induced to adopt the latter view, were it not also an observed and recorded fact that a young queen with crippled wings, reared in an artificial colony, laid drone-eggs, though the hive contained no drones. This being the case, we cannot avoid conceding that, to enable a queen to lay drone-eggs, fecundation is altogether unnecessary. Does not this likewise fairly lead to the further inference, that all drone-eggs are unimpregnated? Again, since it is an admitted fact that the seminal sac or spermatheca of every worker-egg-laying queen contains a milk-white viscid liquid, whilst the spermatheca of every sterile or only drone-egg-laying queen is either entirely wanting, or contains a limpid, watery fluid, is it not reasonable to infer a connection between the production of worker-eggs and the milk-white liquid in the spermatheca, and that the worker-eggs thence derive their impregnating matter?—in other words, that the spermatheca contains the male semen. But if the ovaries be not impregnated in copulation, and all the eggs germinated and developed therein be male, I cannot conceive how the laying of female eggs, which takes place only when the spermatheca contains the milk-white liquid, can be explained otherwise, than by assuming that the male eggs are converted into female, by being brought into contact with semen from the spermatheca; and that

the eggs remain male when not exposed to such contact—an operation which the queen can effect or omit at her option. And that she possesses such optional power, is evident from the fact that she frequently passes from worker to drone-cells when ovipositing, and lays, as it were in one breath, eggs from which proceed workers and eggs from which proceed drones.

I repeat, I reasoned thus, as it is my habit never to inquire about the *possibility* of what I know exists, but to content myself with believing that what actually exists, *is possible*.

A few remarks more. On examination, I found the difference between the spermatheca of a fecundated and an unfecundated queen, to be invariably constant and uniform. Of sixteen fecundated queens which I dissected in the fall of 1851 and 1852, each had the spermatheca filled with a milk-white, viscid liquid; and of twenty-seven unfecundated queens dissected in those years, I found the spermatheca was either wanting or filled more or less with a limpid, watery fluid. Now, this constant and uniform difference being a fact, the only question remaining is whether the milk-white liquid is in reality the semen of the drone or male. This, too, has been settled by the microscopic examinations made by Prof. Leuckart and Prof. Von Siebold. Each of them found spermatozoids identically similar in the contents of the spermathecæ of fecundated queens, and in those of the testes of drones. The latter, moreover, found spermatozoids identically similar in worker-eggs, but never found any in drone-eggs. See his treatise "*On Parthenogenesis in Bees, &c.*" The demonstration is perfect and conclusive.

Gundelach and others imagined that the viscid liquid contained in the spermatheca, was intended simply to serve as gluten to enable the queen, when ovipositing, to attach the eggs in their proper position to the bottom of the cells. This, indeed, *might* be so, but is not so in reality. This is clearly shown, by the fact that the drone-egg-laying queen sent by me to Dr. Barth for dissection, in 1852, attached all the eggs she laid, quite methodically to the bottom of the cells, though on dissection it was found that *she had no spermatheca!*

(For the "Bee Journal.")

Can swarms be divided in the common box hive, and if so, how? Or how can you prevent natural swarming in the common hive? Any information would much oblige J. B. D.

Marion, Forest Co., Pa.

☞Please send us the names of beekeepers.

[For the "Bee Journal."]

I wish to submit the following for you or others to solve:

If it requires the drone-sperm (which is animal secretion), to be deposited with the queen to enable her to impregnate the drone-eggs, in order to produce workers, which is a distinct bee in its physiology and in its propensities, from that of other bees; and it requires the royal jelly (which is nine-tenths animal secretion), to impregnate the worker-larva so that it would become a queen, which is a distinct bee in her physiology and in her propensities; the worker and queen are both impregnated by animal secretion. I wish to know from what bee the secretion possessed of such impregnating power is obtained, which is found with the royal larva. Is there any difference between that found in the queen's spermatheca and that found with the royal larva, when separated from other substances? The solving of the above, will be of the utmost importance in settling that vexed question relative to the natural habits and reproduction of this bee, and the phenomena of hybrids between the common and the Italian bee. It is a subject which is at the foundation of the true history of that truly wonderful insect, the honey bee.

Henrietta, N. Y. E. Kirby.

☞The error of our correspondent consists in supposing or assuming that drone-sperm and royal jelly are both animal secretions and substantially identical; whereas, the former alone is an animal secretion, and the latter a chylified substance. The first contains innumerable spermatozoa, living and active; and proved by Prof. Von Siebold to be identical in the testes of the drone, the spermatheca of the queen, and the yolk of the worker-egg—but never found in the drone-egg. It serves only for procreative ends, and from its nature can serve no other purpose. The second is a product of partial digestion in the chyle stomach of the worker; and consists, according to the analyses of Drs. Wetherill and Dönhoff, of highly concentrated nitrogenous substances;—serving the purpose of nutrition, and not adapted for any other purpose.

The microscopic examinations and chemical analyses of Prof. Von Siebold, and Drs. Wetherill and Dönhoff, are regarded as accurate and conclusive. If our correspondent is in possession of scientific investigations exhibiting different results, we shall be pleased if he will communicate them to us for publication.

☞*Please send us the names of beekeepers.*

[For the "Bee Journal."]

To Introduce an Italian Queen

IN A COLONY OF COMMON BEES.

Many Italian queens have been lost, both in this country and in Europe, in the attempt to introduce them among colonies of common bees. The following facts confirm the statement that common bees do not as readily receive such queens, as one of their own kind.

In September last, I deprived a stock of common bees of their queen, and a few days after, cut out all the rudimental queen-cells. After the lapse of a few days, a second instalment of royal cells was destroyed, and a common queen (not their own) being offered to the bees, she was well received. The manner of her reception being ascertained, she was in a few moments removed, and an Italian queen (both queens were impregnated) was given in her stead. She was stung to death before she could be rescued from the enraged bees. The common queen being immediately returned, was again received with great favor.

As many persons will endeavor, the coming season, to give Italian queens to common colonies, I shall give the method used by Messrs. Brackett and Carey, who introduced hundreds last year, with almost uniform success.

A *queen-cage* is used, made as follows: Take a piece of wire-cloth, three inches square, and roll it into a tube, with a lap of three-eighths of an inch. Fasten it to a piece of soft wood, by driving a tack at each end through the lap. Take away the queen from the colony to which the Italian queen is to be given, and in from four to ten hours, or as soon as the bees manifest undoubted consciousness of their loss, put the Italian queen into the cage, with about a dozen workers of her own colony. Before confining her, put into one end of the cage a piece of sponge, about the size of a robin's egg, filled with honey—which is better than sugar syrup, as it does not dry up so soon. After closing both ends with a cork, put the cage on the frames, directly over the cluster, the honey-board being taken off. Let it remain in this condition for about thirty-six hours, and then remove one of the corks—disturbing the bees as little as possible. When a hive without frames is used, the queen-cage should be placed between the combs. If the weather be cool, the hive should be kept in a place moderately warm, so that the queen may not become chilled, even if the bees should not cluster upon the cage.

As circumstances may occur to render a more speedy introduction desirable, I give substantially the method by which I seldom failed to introduce the Italian queen, in less than an hour after the removal of the common one. Drive the bees from their combs; after removing the queen, shut them in a box well ventilated, and place them a few rods from their old stand. Give them honey in a feeder, so that all may be completely gorged; and in about fifteen minutes after they miss their queen, offer them the Italian queen. As soon as they receive her, restore them again to their combs, and put them on their old stand. In hiving new swarms, I have been able to introduce the Italian queen, immediately after the bees became aware that their own queen was gone. Unless queens are plenty, I advise adhering to the plan first described.

Oxford, Ohio. L. L. L.

(For the "Bee Journal.")

I would inquire through the Bee Journal, the right distance apart for frames? Some say 1¼ inches, and others 1½ inches apart.

Last season I gave queen-cells to artificial swarms, made by division, and found that the bees generally destroyed them and raised queens from the egg. I think the reason was giving them the cell, when I divided them, and before they had discovered the loss of the old queen. I would like to know whether any one else has noticed the same?

Canfield, Ohio. J. W.

☞To ascertain whether larvæ could be reared in royal cells by means of artificial heat, I cut out of one of my hives four royal cells containing jelly. From one of these I removed the larva, and substituted for it a worker larva one day old, and placed it in an incubating stove kept at a temperature ranging from 88° to 104°. When the larva had consumed the jelly, I gave it a further supply taken from one of the reserved cells, diluting it slightly with water. It was interesting to observe the greediness with which the larva devoured the pollen, after fasting several hours. It grew so rapidly, that the increase of size from day to day was plainly perceptible. I gave it fresh supplies of food every morning; and when, after five or six days, it appeared to have attained full growth, I capped the cell; and on the fifth after capping, I found a fine royal nymph therein.

I made similar experiments to rear worker-larvæ two and three days old, by feeding them with a mixture of pollen and honey, but failed in every instance. They survived only two or three days, under such treatment. DÖNHOFF.

☞*Please send us the names of beekeepers.*

Poison of the Bee.

BY THE REV. GEORGE KLEINE.

Dr. Dönhoff, in one of his recent "Contributions to Bee Culture," gives us an interesting article on the poison of the honey bee. In the course of it, he refers to the question whether the human body can become so accustomed to the virus, that the influence of a sting shall no longer produce swelling or other unpleasant effects. On the ground of theory and experience he appears to maintain the negative, though the negation is not expressed in so many words. As I have repeatedly alleged that this result does take place, the respected author of the article referred to, will excuse me for endeavoring to sustain the opinion I entertain.

Dr. Dönhoff himself ascribes the effect of the poison, to an irritation of the nervous system and of the organism in general, whence pain, inflammation and swelling supervene. Although I entirely concur with him in this view, I nevertheless do not concede that the theory militates against the assumption, that the nervous system and the organism in general, may gradually become habituated to the irritation to which they are frequently exposed, and may consequently become less sensitive thereto. I cannot, of course, undertake to maintain a scientific controversy on a topic foreign to the sphere of my usual studies. I can merely rely on the proverbial truths that "habit is very powerful," that "habit is a second nature;" and refer to the case of the segar-smokers, the opium-eaters, the coffee-drinkers, and the grog-bruisers. I infer that in each and all of these, the irritability of the nervous system must gradually have become less sensitive or acute. It is also a well known fact that persons perpetually exposed to them do, from habit, gradually become indifferent to the most offensive odors, so as to be no longer disagreeably affected by them; and that the tongue and palate may be educated to disregard the most pungent spices. I know likewise, from personal observation at the hotel in Düsseldorf, that a pinch of snuff caused a violent fit of sternutation in Dr. Dönhoff, while another, taken from the same box, at the time failed to excite a single sneeze in Dr. Schmidt. Theorizing on these facts, I conclude that the nervous system must be able to become habituated to the action of *nicotine*, alleged to be virulent poison. Still, as before remarked, I do not undertake to controvert the reasonings of scientific men. I cleave to actual practical experience, and thus feel myself strong in the matter under consideration.

If ever one suffered from the unpleasant effects of bee poison, I am the man. A sting on my hand would cause such a swelling of the arm and shoulder, that my coat sleeve, none of the narrowest either, had to be turned inside out in drawing it off. And a sting in the face produced so huge an intumescence, that I could literally see daylight only by lifting with my fingers the tumefied pendulosities hanging from my brow. I was so repeatedly placed in unpleasant predicaments by such occurrences, that I was often on the point of abandoning bee culture altogether. But my attachment to the bees regularly triumphed, and my perseverance finally enabled me to secure exemption from suffering. Swelling no longer supervenes when I am stung; except slightly, if the wound happens to be on one of my eyelids.

I am now indeed classed among quinquagenarians, and it might be supposed that my skin has become tough and callous. I will therefore cite more youthful testimony, in the case of my nephew, whom I educated in bee culture and who has a thorough love for the pursuit. He too, at first, became much swollen when stung, and if the infliction happened to be in his face, would be so disfigured thereby that his intimate acquaintances no longer knew him. He has now so completely overcome this, that he scarcely thinks it worth while to extract the sting when he happens to be stung. He is only fifteen years old, and his skin retains all its youthful softness and sensibility.

I could add other similar examples which have come under my own observation; but will refer only to the case of William Günther, the well known beekeeper of the Baron of Berlepsch, and who is a practical apiarian *sans compare*. He informed me that originally he had a decided antipathy to bees, and avoided them whenever he could, because their stings affected him grievously—often causing temporary blindness. But all this passed off, when his system became accustomed to the virus. Günther is still in the prime of life—in the full vigor of youth and health; and in his case, therefore, the immunity can only be accounted for, on the ground that his organism has become habituated to the poison.

But still this habituation requires time, and may be aided or retarded by the peculiar constitution of the individual. I noticed exemption in myself only after the third year; whereas a single season sufficed to render my nephew sting-proof. I do not doubt that in time Dr. Dönhoff also will so accustom his system to the poison, that he shall no longer be able to use his own person as a test of its effects on the human organism.

☞Please send us names of beekeepers.

[For the Bee Journal.]

Persons of a sanguine temperament are apt to fancy that bee culture is so simple a matter, that whoever engages in it cannot fail to be successful. It may be well to make a few suggestions for the benefit of such.

Anybody may certainly keep bees, but not every one is qualified to become a true bee culturist. Certain peculiar talents, tastes and traits, physical, mental and moral, are required; and without a due proportion and combination of these, success is not probable, if possible.

Among the physical requisites are strong arms, a steady hand, a keen eye, and a sweet breath. The mental or intellectual endowments are not less important. He should possess a good memory, a sound judgment, habits of close observation and accurate discrimination, with some ability to divine results from casual incidents or remote causes. He must be in no wise superstitious, but should ever strive to have a good reason for what he does or designs to do. So finally, certain moral qualities are equally indispensable. Yet if, at the start, he possess these only potentially, they may soon become adequately developed and fixed by practice. He must be cool, self-possessed and patient; not hasty and ill-tempered. He must be fearless and resolute; economical, yet not miserly; at times liberal, but never lavish; forbearing and sympathizing, but not weakly compliant and yielding. He must be prompt and energetic, yet careful and cautious—never negligent or procrastinating. He must be neat, tidy, and cleanly in his person, arrangements and processes; and a decided and uncompromising foe everywhere to slovenliness and sloth. The miserly would let his bees starve when a few pounds of honey would save them, because he cannot resolve to make the needed though only apparent sacrifice. The weak-minded and irresolute would not dispose of his feeble stocks at the proper time, but nurse them along in their helplessness—thus providing for himself an annoyance and a plague. The timid would fear to operate among his bees as he should, and be likely to devolve important manipulations on some bungler, or inexperienced neighbor. The negligent would not arrange his apiary or cleanse his hives seasonably. Nor would he use the needed precautions when feeding weak stocks, or depriving others of surplus stores; thereby attracting robbers and exposing his apiary to destruction. And the slovenly will permit spiders, ants and vermin to infest his bee house, and moths and worms to invade and harbor in his hives.

It is hence obvious, why he who engages in bee culture should possess the enumerated qualities. It is not, indeed, indispensable that all of them should be fully developed at first. If he only have a natural aptitude for them, they will be stimulated by practice, and finally also influence his deportment in other pursuits. We shall rarely find a thorough beemaster who is an improvident housekeeper, a careless parent, a spendthrift, or a bad citizen; or who is impatient, irascible or domineering. He will generally exemplify by his conduct the truth of the adage, that he who is competent and faithful in minor matters, will be found so likewise in more important concerns.

Strange Sight—Seventy Swarms of Bees at War.

Ezra Dibble, a well known citizen of this town, and for many years engaged extensively in the management of bees, communicates to us the following interesting particulars of a battle among his bees: He has seventy swarms of bees, about equally divided on the east and west sides of his house. On Sunday, Aug. 14, about 3 o'clock, the weather being warm, and the windows open, his house was suddenly filled with bees, which forced the family to flee at once to the neighbors. Mr D., after getting well protected against his assailants, proceeded to take a survey, and if possible, learn the cause which had disturbed them.

The seventy swarms appeared to be out, and those on one side of the house were arrayed in battle against those on the other side; and such a battle was perhaps never before witnessed. They filled the air, covering a space of more than one acre of ground, and fought desperately for some three hours—not for "spoils," but for conquest; and while at war, no living thing could exist in the vicinity. They stung a large flock of Shanghai chickens, nearly all of which died, and persons passing along the roadside were obliged to make haste to avoid their sting.

A little after 6 o'clock, quiet was restored, and the living bees returned to their hives, leaving the slain almost literally covering the ground, since which, but few have appeared around the hives, and those apparently stationed as sentinels to watch the enemy. But two young swarms were entirely destroyed, and aside from the terrible slaughter of bees no other injury was done. Neither party was victorious, and they only ceased on the approach of night, and from utter prostration. The occasion of this strange warring among the bees is not easily accounted for; and those most conversant with their management never before witnessed or heard of such a spectacle as here narrated.—*Conneaut (Ohio) Reporter.*

☞The above account of a most singular freak of bees was published about seven years ago, but is of sufficient interest to merit preservation.

(From the "Bienenzeitung.")

The Italian Bee.

BY DZIERZON.

For me, the Italian Bee possesses not only an equal, but a much greater importance and value for *practical* purposes, than for mere demonstration of *theory*. My own convictions as to the entire correctness of the theoretical principles on which my system of bee culture is based, were perfectly clear and fixed, long before I saw an Italian bee. The introduction of this species possessed interest for me, in a theoretic point of view, only as furnishing the means of readily and palpably confuting the objections so pertinaciously urged by my opponents. They could thus be confronted with ocular demonstration of that which, till then, they neither could nor would see; and the truths which they were ever and anon questioning and denying, could thus be made manifest to them and to every inquirer. In this aspect, however, the importance of the Italian bee was necessarily transient, continuing only till the triumph of truth was conclusively secured. Nevertheless, the Italian bee will continue to be of importance in some other theoretical relations. Various observations—for instance, how long workers live under peculiar circumstances, or in particular localities and seasons—will be greatly facilitated by means of this distinctly marked insect; and that most difficult task, the detection of a fertile worker in a drone-breeding, queenless colony, may be accomplished with comparative ease, by employing this species. But, for practical bee culture, the importance of the Italian bee is vastly greater, because it is direct and permanent.

Distinguished as the Italian bees are from the common kind by their color and markings, they are equally distinguished from them, in other respects, by peculiar traits and properties, always decidedly advantageous to their owner. My experience and observations in this regard, are fully corroborated by those of Capt. Baldenstein, Mr. Rothe, Dr. Dönhoff, Rev. Mr. Kleine and others.

Their importance for practical bee culture, I conceive, results from the following five peculiarities:

1. *Their marked difference in color.* I find this important in practice, not simply because they are prettier—though external appearances are not matters of indifference with persons of taste; but because, at least when first introduced in a neighborhood, they can readily be distinguished from those usually cultivated there, and hence serve for some time to prevent vexatious controversies respecting the ownership of fugitive swarms. Thus I was able with a clear conscience to designate and reclaim as mine, a swarm which had decamped from one of my apiaries, and which those who found it were about hiving, when I arrived in pursuit. In such cases, it is not even requisite that the fugitive swarm should be composed wholly of bees of the pure race. If, by the insertion of a single brood comb, a few hundred Italian workers have been introduced among common stock, the issuing swarm will be sufficiently mixed and marked to be easily recognised.

2. But of still greater importance is *their superior industry*, their indefatigable eagerness to gather honey and increase the stores of their hives. At the close of the season especially, when forage begins to fail, they will visit flowers disregarded by others; will resort for supplies to the saccharine juices of damaged fruit; and will even attack the hives of common bees. This latter propensity may indeed, at times, become a source of annoyance. But gathering honey and robbing stores are, in a great degree, inseparable instincts in bees; and he who is delighted by the former trait, displayed while the season is propitious, must not complain that the latter exhibits itself in times of comparative scarcity. He can require from his bees, as irrational creatures, no higher standard of morals, than to appropriate honey wherever it is accessible. But this greater propensity to rob, does not involve any danger to the Italian stocks themselves, because—

3. The Italian bees are *the most fearless and intrepid defenders of their own stores.* They are much more vigilant than common bees, and not so easily circumvented. Every stranger that seeks entrance into their hives—whether of Italian or common origin—is at once arrested, and repelled or slain; and I doubt whether an Italian colony possessing a healthy queen, could be conquered by any assailants. The frequent examinations to which I had occasion to subject my artificial Italian colonies, to ascertain whether they would receive an offered queen, or whether a young queen had been hatched, or had been fecundated, or was producing genuine brood—and which had to be made when robbing-bees were numerous—often exposed those comparatively feeble colonies to violent and even furious assaults. They were usually surrounded, in a few minutes, by crowds of assailants, among which, the Italian bees (whose sense of smell appears to be exceedingly acute) were always prominent. But on closing the hive, peace and quiet were immediately restored, because not a bee could force an entrance or succeed in abstracting the coveted treasure. A few bees suffice to

guard the entrance, and weak colonies can easily repel an attack. For successful defence, vigilance, courage and agility are the indispensable requisites—qualities in which common bees are greatly deficient, but which the Italians possess in the highest perfection. If, in autumn, we find the most ample stores in our Italian hives, and obtain from them not only the earliest swarms in the spring, but some surplus honey likewise, in years when common bees can spare none, these results are attributable in part to the good qualities already referred to, possessed by the Italians, but more especially to the significant fact that this species of bees

4. *Kill their drones earlier in the season* than common bees do—usually soon after the young queens have been fecundated and commence laying. Hence their drones sometimes disappear ere we are aware of their expulsion, even early in June. Whereas common colonies are then still producing them in abundance, and frequently retain them till September and October—thereby causing the useless consumption of many pounds of honey. Though an early expulsion of drones may not be desirable when we are anxious to rear an additional supply of young queens of the pure race, yet this peculiar propensity is of the utmost practical importance, since a large amount of honey is thereby saved, and bee culture consequently rendered more remunerating. Besides, when the preservation of drones to a later period is desired, it can be accomplished by removing the queen from some populous colony, and the bees in accordance with their native instincts, will retain their drones while engaged in rearing a successor.

5. But the most agreeable trait which pure Italian bees exhibit, is *their tractableness and docility.* They very rarely sting, and usually only when they have been accidentally annoyed or designedly irritated. Common bees not unfrequently become exceedingly troublesome and sometimes dangerous; but nothing of the kind need be apprehended from the Italians. Even when mingled together in the same hive, the common bees retain and manifest their irritability, and the Italians their placableness—showing that these traits in each are peculiar and natural. So long as the race is kept pure, this is its distinguishing and most gratifying characteristic; and we are thus assured of the permanent significance of the Italian bee in practical bee culture.

☞We are printing heavy editions of the Bee Journal, and will be pleased to forward specimen copies to all who wish them. Our friends will oblige us by sending names of beekeepers.

Delayed Fecundation.

In his "*New Observations on Bees,*" Huber assigns twenty-one days as the longest term during which a queen-bee is susceptible of fecundation, so as to become *fully* fertile—that is, capable of laying *both* worker and drone-eggs. His opinion was based on the results of five carefully conducted experiments, in which queens aged from twenty-two to thirty-six days, were observed to make excursions and return bearing evidence of copulation, but each of which, to his amazement, subsequently laid drone-eggs only. These results were so generally regarded as settling the question, that the term of twenty-one days, as "the outside limit," is accepted by apiarians and has almost become a stereotyped phrase in treatises on bee culture.

Recent observations, however, have shown that the term is not thus limited, and bring the whole subject up for re-investigation. The Baron of Berlepsch states that he has had several queens which were fecundated after they were thirty days old, and still proved to be *fully* fertile; and that on the 23d of July, 1856, he saw an Italian queen, which emerged from the royal cell on the 20th of June, return to her hive with marks of fecundation. A few days later she laid eggs in worker-cells, from which workers and not drones were afterwards developed. In this instance the queen was thirty-three days old; and there seems to be no reason to doubt the correctness of the statement.

Dzierzon also mentions four queens, hatched about the 20th of August, 1856, which he observed returning from excursions on the 25th and 26th of September, with evidences of copulation. But, as he does not say that these afterwards laid worker-eggs, it is uncertain whether they became fully fertile or not, and no inference either way can be drawn from the observation.

But in a late communication to the Bienenzeitung, Mr. Hemman, of Weissenfels, relates the case of an Italian queen, hatched on the 31st of July, 1860, which returned with marks of copulation on the 21st of August, but remained sterile. On the 15th of September, she was again seen returning with evidence of fecundation. She subsequently laid worker-eggs, and on the 25th of September, the combs contained capped worker-brood. Here was an interval of forty-six days, though the queen still became fully fertile. On the 28th of September, Mr. Hemman also saw another queen, hatched on the 31st of July, returning from an excursion after an absence of fifty-eight minutes—being then fifty-nine days old. Whether this queen afterwards became fertile, was not ascertained when the communication was written.

These statements warrant the inference that Huber's opinion was based on insufficient data, and that the question remains unsettled. But the introduction of movable comb-hives has so increased the facilities for observation and so multiplied the number of observers, that the full extent of the limit cannot long remain undetermined.

[For the "Bee Journal."]

Modification of Kritz's Method.

Might not Kritz's method, as described in the April number of the Bee Journal, be improved as follows?

After drumming out as many bees as you can from A, set the forced swarm on the stand of A, and remove B to a new place, putting A on its stand. You thus secure enough bees for A, to take care of all the eggs and brood, and to work vigorously in rearing queens—while the course of Kritz may sometimes occasion a severe loss of brood or eggs.

As soon as A swarms, put the swarm where A has now been standing, removing C to a new place and putting A on C's stand. When A swarms again, put the swarm on A's stand, removing D to a new place and putting A on D's stand. When A throws out its third swarm, put the swarm on a new stand.

The arrangement will be as follows:

Originally:

After drumming out a swarm from A:

After A yields the first voluntary swarm:

After A yields the second voluntary swarm:

After A yields the third voluntary swarm:

It might be advisable, after A has thrown its third swarm, to put the swarm in the place of B, removing B to a new stand; and a few days later, when there is no danger that A will swarm again, it might be put on the stand of B, and B removed to a new place.

It will be well for those whose experience with movable comb hives is small, or who for any reason prefer natural to artificial swarming, to test this plan with their movable comb hives.

Oxford, Ohio. L. L. LANGSTROTH.

☞I have noticed that some colonies carry in much more pollen than others, even when there is no perceptible difference between them as to strength or age. Honey from colonies that gathered much pollen, I have also found difficult to drain from the combs. It is of greater consistency, and more viscid or *tough*. As regards sweetness and flavor, I could perceive no difference.

A. BRAUN.

EFFECTS OF COLD ON SPERMATOZOA.

Dzierzon and Berlepsch have remarked that a queen bee exposed for some time to a temperature below the freezing point, becomes incompetent to lay worker-eggs. Berlepsch attributes the result to the freezing of the spermatozoa. Last winter, I exposed a normally fertile queen to a degree of cold ranging from 25° to 30° Fahr.; and then returned her to her hive, after she had revived. She laid no worker-eggs subsequently. Three weeks later, I killed and dissected her. Under a microscope of 400 linear magnifying power, the contents of the spermatheca presented the appearance of a homogenous fluid, totally devoid of spermatozoa. It seems, hence, that the spermatozoa not only lose the power of motion, but are really decomposed by the action or effects of frost.

DÖNHOFF.

☞Our friends will please accept our thanks for their exertions in behalf of the Bee Journal.

[For the Bee Journal.]

Hermaphrodite Bees.

In the "Entomologist's Annual" for 1859, there is depicted and described a hermaphrodite bee, of which one side bears all the characteristic features of the male, and the other those of the female.

Accounts of similar androginous bees are contained in the Bienenzeitung for August 1, and October 10, 1860—the specimens having, in each instance, been sent to Dr. Dönhoff for examination and description. The first specimen resembled a worker in the anterior portion of the body, and a drone in the posterior. The second specimen resembled a drone on the upper or dorsal side, and a worker on the lower or ventral side. Dr. Dönhoff describes each very minutely; and when treating of the first, submits the following suggestions as to the manner in which that remarkable insect originated:*

1. "It is possible that the egg from which this bee proceeded, contained two yolks; and that the one was impregnated, while the other remained unimpregnated. In the one yolk a drone began to be developed, and in the other a worker. These gradually coalesced, and were finally blended into one.

2. "The process of development can be more easily explained in accordance with the Dzierzon theory of the origin of drones from unimpregnated eggs. Thus the egg contains the male individual *in potentia;* the spermatozoid contains the female germ *in potentia.* The development of all creatures consists in the blending of the germ of the spermatozoid, with the germ of the egg. In the development of the worker, the germ of the spermatozoid predominates in such a manner, through impregnation, that it (the female) is fostered and produced. In the case before us both became developed, though imperfectly, so that the spermatozoidal germ produced the head and thorax, and the egg-germ produced the abdomen."

In the fall of 1857, Mr. Samuel Wagner, of York, (Pa.) communicated to me a theory on the origin of drones and workers, the object of which was to show *how* the same egg might produce a worker or a drone, according as it was or was not impregnated—the fact that a drone comes from an unimpregnated egg, and a worker from an impregnated one, having been put on the basis of complete demonstration by the dissections of Prof. Von Siebold. (See *Langstroth on the Hive and Honey Bee*, page 41, 3d edition.)

Mr. Wagner's theory, for substance, was that there are two germs in every impregnated egg, one male and the other female; the male germ being derived from the queen, and the female from the drone—each sex tending naturally to produce opposite sexuality. When the egg is not impregnated by spermatozoids, it contains a male germ only; and from it, when hatched, a drone will be developed. When the egg is impregnated, two germs are present; but the female germ, being the more vigorous and energetic, grows more rapidly (as is evidenced by the fact that the worker reaches maturity sooner than the drone,) and absorbs all the nutriment; while the more sluggish male germ either remains dormant, or after a brief and ineffectual "struggle for life," succumbs and perishes. There is something analogous to this in the growth of one bud on a plant, which is often so rapid and vigorous, that the other and adjoining buds remain dormant or die soon after beginning to grow.

Prof. Joseph Leidy, of Philadelphia, the celebrated microscopical anatomist and physiologist, when asked to dissect the impregnated eggs of the bee, to see whether he could not find there two germs, informed me that the demonstration of such a double germ was beyond the reach of any skill then possessed.

It will be seen that Dr. Dönhoff's theory closely resembles that of Mr. Wagner; and the discovery of these mongrel bees, gives a new interest to the whole matter. If two germs exist in every impregnated egg, then it is easy to conceive how, under some peculiar circumstances, both may grow and the result be a *monster*—the germs growing into each other, like other monsters in the animal and vegetable kingdoms; neither germ being able to overcome the other, or to obtain sufficient nutriment for its complete separate development.

The facts already established in the physiology of the honey bee, have overthrown many opinions previously regarded as demonstrably true; and a wide field is open, especially to medical and scientific men, for further investigations.

Oxford, Ohio. L. L. LANGSTROTH.

---

*Dr. Donhoff's reports on these anomalous bees will be given in the next number of the Bee Journal. [*Ed.*]

☞It is a common notion that a colony whose drones begin to fly before eight o'clock in the forenoon, will send forth a swarm on the same day. This is by no means a reliable criterion, for I have often seen drones flying before that hour, and on one occasion before five o'clock in the morning, from a colony whose bees were hanging out in clusters; yet no swarm issued, either on that or the following day. A. BRAUN.

(From the "Bienenzeitung.")

The Coloring Matter of Wax.

BY DR. DÖNHOFF.

When honeycomb is melted and run into very thin flakes, we find that the unbleached wax is of a clear, bright-yellow color. When it is run into somewhat thicker flakes, the color deepens to an orange hue.

This results from the fact, that the originally snow-white wax of the comb acquired in the hive, in process of time, a bright-yellow color, even if the cells never contained honey or brood. This color is always deepest or darkest in old comb. When old dark-colored comb is melted, a black, insoluble sediment will be deposited, and a deeply orange-tinged wax will flow off. The interior surface of the sides and top-board of a well stocked hive will, sooner or later, at least in parts or spots, assume the same tint. This yellow coloring matter is essentially difierent in hue, from the golden or orange-tinge which characterizes the uncrystallizable sugar of honey. How does it originate? I have made the following observations and experiments:

1. I kept honey several months in a wooden box, placing it alternately on a stove and in a cellar. The interior surface of the top of the box did not assume a yellow tinge; neither did the sides, which were in constant contact with the honey. A few drops of a dull, orange-colored water, were condensed on the inner side of the top.

2. I placed pollen combs, brood combs, and slats covered with propolis in newly planed boxes. The color of the interior remained entirely unaffected by the contents.

3. I placed a wooden box, containing new, clean comb, in a hive having ample stores of honey, pollen and propolis, from which the bees had just been expelled; and exposed the whole alternately to heat and cold. The combs and the inside of the box remained unchanged in color.

4. I melted together recently built comb and the freshly gathered honey it contained, mixing the mass thoroughly, by stirring it well. On cooling, I drained off the honey. The wax remained white.

5. I introduced a colony of bees, this spring, into a hive well furnished with empty combs, and gave them at first only half a pound of honey, but subsequently supplied them with six pounds of sugar dissolved in water. The weather was still too cold to permit the bees to fly. When the dissolved sugar was carried up, and I found in the cells and in the honey-bags of the bees, only pellucid sugar water, I placed a small wooden box in the hive immediately below the cluster of bees. In a few days, the box became tinged a bright yellow, in spots. I repeatedly placed in the hive, small wooden troughs containing moistened loaf sugar. This was soon densely covered with bees, and in from four to twelve hours, I uniformly found the troughs tinged with a bright-yellow hue, particularly where the sugar had been in contact with their sides. When allowed to remain several days, the troughs assumed an orange color.

6. I placed in the hive a small box with sugar, setting it on a white board and elevating it just high enough not to permit bees to get between it and the board. Nevertheless, I soon found yellowish spots on the latter.

7. I cut this board in pieces, placed them in a porcelain cup, poured alcohol on them, and set it to boil over a spirit lamp. The alcohol was soon tinged with yellow, and on evaporation left an orange-colored residuum. The yellow spots disappeared from the wood, and the residuum, on being tested, exhibited no indication of containing sugar.

8. I placed honey in cold alcohol, which extracted the syrup, but not the coloring matter. Hot alcohol dissolves the grape sugar of honey.

What results were thus obtained?

A. From experiments 1, 2 and 3, it is evident that neither honey, nor pollen, nor propolis contain exhalable coloring matter.

B. Experiments 4 and 5, show that the yellow coloring matter emanates from the bees.

C. From experiment 6, it is manifest that the color is not communicated to the wax by the proboscis of the bees, as Huber thought. As it appeared in places inaccessible to the bees, it must have been conveyed thither in exhalations emanating from them.

D. From experiments 5 and 6, it seems, moreover, to follow that this coloring matter is exhaled by the bees, even when they do not consume honey.

[For the "Bee Journal."]

I will now tell you what my bees have done. Last June I had two old stocks. One threw off a swarm on the 3d of June, which I saved. In about ten days it swarmed again, and once more on the third day after—thus making three swarms from that hive. The other swarmed four times, the same month—making from the two stocks seven young swarms, of which six have *died*. "Too much pork for a shilling."

Southampton, Mass. L. P. W.

[For the "Bee Journal."]

To keep Frames firm.

It is, in many cases, important to know how to keep the frames in the Langstroth hive securely in place—so as to admit of safe transportation—without interfering with the easy removal of the combs.

Bees, in order to give their combs greater strength, usually build them more or less waving.* To remove them safely from the hive, it therefore becomes necessary, either to allow some play between the frames on which they are built, or to take them out, as in the Berlepsch plan, (see No. 1 of the Bee Journal,) from one end of the hive. If any play is left, there is danger of the frames sliding too close together when the hives are moved.

In the Bee Journal for March, a method to keep the frames firm is given by *Apis*. I believe the plan devised by me more than a year ago, and tested fully last summer by a number of experienced beekeepers, is preferable to that of *Apis*.

A brad or tack (better still, a small staple, such as is used to fasten the slats of blinds,) is driven into each end of the uprights of the frames, about half-an-inch from their bottoms, and so as to project three-eighths of an inch. In order to be able to change any frame end for end, and not have these brads interfere with each other, one should be driven on that side of the front upright, facing you when you look at a frame, and the other on the opposite side of the back upright. These brads will prevent the frames from ever getting so close on their sides or bottoms as to injure combs or bees, and yet will not at all interfere with the play between the tops of the frames, so necessary for their safe and easy removal.

As one upright of each end frame will have no brad, two nails or pieces of wood must be fastened, one near the front left-hand corner of the hive, and the other near the opposite rear corner, and projecting three-eighths of an inch from the sides of the hive—so as to keep the front of one end frame and the rear of the other, from coming too close to the walls of the hive.

To keep the frames from sliding too near the front or rear walls of the hive, drive brads into the uprights about one inch from their bottoms, on the sides facing the walls of the hive, and projecting one-quarter of an inch. These brads will still allow a play to the frames, from front to rear, or from rear to front, one-eighth of an inch, which is enough to loosen the frames when fastened to the rabbets by propolis, without crushing bees. They also greatly facilitate the safe removal of a frame, as the front or rear brad may be made to bear against the wall of the hive, so as to *steady* the frame when it is lifted out, and prevent the uprights from hitting the sides of the hive and crushing bees.

With these brads, a hive may be safely transported to any distance, unless exposed to very rough handling; and any frame may be more readily taken out than when no brads are used. If the hive is to be moved over rough roads, a few wads of paper or cotton, crowded between the frames where they rest on the rabbets, will make all secure. By placing two strips of wood on the frames where they rest on the rabbets, so as to fill the space between them and the honey-board, and then screwing this board fast, the hives might be turned upside down, or subjected to any usage which would not break the combs. The cost of these brads is only a few cents to a hive; and any frame may be put in any place, or reversed, without any interference.

Brads might be put on the alternate edges of the tops of the frames, so as to keep them at the proper distances from each other; but they would often seriously interfere with the play necessary for the safe removal of combs. When a hive is first used, two notched patterns will quickly adjust the frames, which should be slightly bradded fast to the rabbets before the patterns are removed.

The projections of the brads, are such as to suit the size of frames given in my book—the tops being one inch wide, and not, as in some of the editions, 1⅛ inch wide.

Oxford, Ohio. L. L. LANGSTROTH.

*The plan of corrugating metal plates, in order to secure more strength, might easily have been suggested by the architecture of bees.

[For the "Bee Journal."]

Last year, there were probably not over twenty natural swarms in this county. Nearly all the increase was artificial. After the first of July, bees did very well, collecting honey; but the swarming season was past.

I have the statement of a man, who is said to be reliable, living in our county, that he took off a top box from one of his hives, which contained 114 lbs. of honey collected last season. This box must have been considerably larger than those used by Langstroth or Quinby.

What is the difference in Harbison's movable comb frames, and Langstroth's?

Van Wert, Ohio. A. W. B.

☞Please send us the names of beekeepers.

[For the "Bee Journal."]

Fertility of the Queen.

Says Mr. Langstroth in his excellent treatise on "the Hive and Honey Bee," p. 32, "the fertility of the queen bee has been entirely under-estimated by most writers. During the height of the breeding season, she will often, under favorable circumstances, lay from two to three thousand eggs a day!"

Mr. Quinby estimates that the queen will lay from 1500 to 2000 eggs a day.—See his "Mysteries," pages 72 and 378.

Harbison—see page 75 of his "Bees and Bee-keeping"—is of the opinion that the queen can deposit 2000 eggs a day.

Reaumer, I am informed, thought the queen would lay 400 eggs a day: Huber's opinion was that, in the prime of the season, in April and May, about 12000 eggs are laid, which is at the rate of something like 200 a day. The various estimates, by ancient and modern writers, are that the queen can lay from 200 to 3000 eggs a day, and from 30,000 to 250,000 eggs during the year. And even at the *present* time, there are writers entertaining the same opinions. Why should there, at the present time, be such a diversity of opinions? The only reason that can be given in explanation, is this: *Writers do not investigate the matter for themselves.*

We have now every facility necessary to investigate this matter properly, to enable every bee-keeper to ascertain, with some definiteness, the fertility of the queen. All that is necessary at first, is to have a hive that will give the operator full control over the contents. Rev. L. L. Langstroth's movable comb hive will give the operator perfect control of the bees, and of every comb and cell within the hive.

Late in the season of 1859—if my memory serves me correctly, I think it was either in the latter part of July, or *early* in August—I took out the combs from one of my movable comb hives, and ascertained by *actual count* the number of cells containing eggs, larvæ and sealed brood. This colony was in possession of a young queen reared artificially,—being only about six weeks old. The *modus operandi* was as follows: Commenced on one side of the hive and lifted out the first or outside comb. The bees, by a sudden jerk, were shaken off of the comb, thereby leaving the cells in good condition for examination. This comb was taken away to a room, that robber bees might not be induced to carry away the honey. The cells having eggs, larvæ and sealed brood were carefully counted, when the comb was returned to the hive. The next comb was then served in a similar manner; also the remaining combs, in all consisting of eight. The hives I now use have *ten* combs.

Below will be found a Chart of the result of this examination. This is the first Chart of the kind, to my knowledge, ever made.

The Chart is as follows:

Where placed.	Eggs.	Larvæ.	Chrysalids or Sealed Brood.	Total of Eggs, Larvæ, and Chrysalis.
1st side of 1st comb,	206*	*		206*
2d " "	374*			374*
Both sides "	580*			580*
1st side of 2d comb,	32			32
2d " "				
Both sides "	32			32
1st side of 3d comb,	980	85	274	1339
2d " "	1323	56	205	1584
Both sides "	2303	141	479	2923
1st side of 4th comb,	206	899	837	1942
" "		247*	46*	293*
2d side "	64	915	808	1787
" "		324*	45*	369*
Both sides "	270	2385	1736	4391
1st side of 5th comb,	42		254	296
2d " "	132		237	369
Both sides "	174		491	665
1st side of 6th comb,	57	208	1122	1387
2d " "	52	127	977	1156
Both sides "	109	335	2099	2543
1st side of 7th comb,	51	477	1275	1803
" "		62*		62*
2d side "		19*		19*
" "	32	367	1256	1655
Both sides "	83	925	2531	3539
1st side of 8th comb,	81	459		540
2d " "	11	109	106	226
Both sides "	92	568	106	766
Total,	3643	4354	7442	15439

* Eggs, Larvæ, and Chrysalids, in drone or store cells.

We deduce from this Chart, the following results: The eggs, larvæ and sealed brood in worker-cells amount to 14,116; the same in drone or store-cells, 1323. Ninety-one cells contain *sealed* drone-brood.

It usually requires in this latitude—43° North

—21 days to perfect workers, and 24 days to perfect drones, from the time the eggs are deposited.

But as drone-larvæ are usually *sealed* on the 9th day after the eggs are laid, it will be obvious that the ninety-one cells containing the *sealed* drone-brood, taken from the whole number of cells occupied—15,439—will leave 15,348—as the number of eggs deposited *within* the 21 days; which gives an average of 730 eggs a day. The whole number of eggs and larvæ amounts to 7,997. The time that is necessary to elapse from the deposition of eggs in either worker or drone-cells, till the larvæ are *sealed*, depends very materially on the *temperature*. We will, in this case, presume that the eggs and larvæ in worker and drone-cells were the result of nine days' laying of the queen, which would give an average of 888 eggs per day. Also, much depends on the temperature in hatching the eggs. The whole number of eggs was 3,643. If it required three days to hatch the eggs, the average per day is 1,214; or, if but 60 hours —two and one-half days—an average of 1,457.

By the facts herein presented we may prove, or disprove, many theories—ancient or modern. I will disprove one and but one. In the "*Natural History of Insects*," issued by Harper and Brothers in 1839, I find the following extract: "The queen must be at least *eleven months* old, before she begins to lay the eggs of *males*." This theory, I believe, is also concurred in, to some extent, by writers of the present day. Every reader must detect the fallacy of this theory, as the queen in the colony I examined was not far from *six weeks* old, and yet the cells contained drone or male brood *sealed*. There are many other theories that might as easily be proved, or disproved, but I will leave them for the present, for other readers and writers of the Journal.

Readers of the "Bee Journal," I am not satisfied with the results given in regard to the fertility of the queen. Since that examination, I have become convinced that the queen can deposit a far greater number of eggs within the time specified in the foregoing deductions. That examination was too late in the season—the combs were too well supplied with honey. I have, however, no reliable facts to present to confirm my belief. My opinion is, therefore, that a young, prolific queen can deposit, under favorable circumstances, 2,500 eggs per day, for a period of twenty-one days, or upwards of 50,000 eggs!

I am in hopes that I shall be able, the present season, to present *facts* to the readers of the Bee Journal to that effect. I would invite others who have the time and patience, to also institute similar experiments with myself. My mode of experimenting the present season, will doubtless be as follows:—I propose to select, either in June or July, a good strong colony, in possession of a young fertile queen; probably *two* colonies, one having a young fertile *native* queen, the other a young fertile *Italian*. Three of the combs most central I will then remove, and introduce therein immediately three empty worker combs. This will be done at a particular time either in the A. M., or in the P. M. Every 72 hours thereafter, for a period of 21 days, I will take out these central combs and supply their places with empty worker combs. The combs taken out, excepting those taken out when the colonies are selected, I will examine and ascertain, by actual count, the number of eggs, and larvæ if any be hatched. The result, of course, at each examination will be registered in a book kept for the purpose. In like manner I would proceed with the other six examinations. In the meantime, combs of larvæ or brood just *sealed*, which may readily be obtained from other colonies in the apiary, should occupy the most of the room on either side of the three central combs, so that the deposition of eggs may be wholly confined to those central combs. The combs taken out for examination will be given to other colonies, so that no loss need be incurred. Farther directions need not be given—in fact some of the foregoing might be omitted—as I expect that scarcely any but *practical* beekeepers, who are aware of the value of the facts we wish to ascertain, will experiment for the purpose of determining the fertility of the queen. When the fertility of the queen is once established, then we shall have the data by which we can construct a bee hive, as regards the *size*, on purely scientific principles.

Some queens, it is true, are more prolific than others, even of the same age; but the *average* of their fertility may be pretty nearly ascertained in a very short time, *provided* a large number of beekeepers experiment at the same time and in the same manner. Who among the many practical apiarians that read the "Bee Journal," will also experiment as designated? Let the fertility of the queen, respecting which there is at present such a diversity of opinion, become settled as speedily as possible.

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y.

☞Instances are on record where the drone-brood was destroyed, by the bees, twice in succession in the spring. Only that of the third laying was permitted to mature. On each occasion about 1200 eggs were laid.

[For the "Bee Journal."]

I received, a few days since, several numbers of "*L'Apiculteur*," a French Bee Journal published in Paris monthly, and now in its fifth year. The numbers received contain articles of all kinds, practical, speculative and comic. Our foreign friend is disposed to season everything with a little fun. The following translated from the February number, on the introduction of queens, will excite the curiosity of all who are interested in the Italian bee and also those who practice the union of feeble colonies. We hope soon to be made aware of the *modus operandi*. Although we cannot complain of our success, we should like to know the safest and most expeditious way.

From the Bienenzeitung, July, 1860, page 157.

"I have had the good fortune to discover a process by which a queen can be introduced to any hive without the least danger of loss of her life, and without any precaution for her protection; for the queen, whether she be fertile or not, is always and to a certainty accepted, even in a hive that may contain another queen, fertile or not, or even a fertile worker.

"The operation occupies but a moment, requires only a very slight expense, no skill nor preparation, and is applicable to all kinds of hives, with or without movable frames. It is, in fact, a process which forms a new era in apiculture; especially if the Italian race is to be generally introduced; for, by it, all danger to the life of the queen vanishes.

"I do not desire to keep this process a secret, by which both time and money may be saved, and I therefore offer to communicate it, by printed instructions, to those beekeepers who will send me a thaler, (about 75 cts.) and to do so as soon as the number of applicants reach a figure to satisfy my views. But to escape any reproach of charlatanism or of avarice, I hereby declare that I will appropriate all I thus obtain, for the benefit of the Beekeeper's Association. For the sake of making this sum as large as possible, I impose upon each one the condition of secresy.

Altenburg, June 22, 1860. HÜBLER."

The Baron of Berlepsch, having visited Mr. Hubler to test the process, sent the following note to the Editor of the Bienenzeitung:

"I have just returned from Altenburg, having passed eight days with Hübler, and I am thoroughly convinced that he has discovered a method by which the safe introduction of a queen is rendered almost infallible. He takes away, for instance, a fertile queen and substitutes one that is not. This latter is with certainty accepted by the colony. He does even more than this; Without taking the trouble to remove the fertile queen, he introduces one in the hive not fertile. The next morning the *first* is dead and the *second* is filling her position.

"Has not this altogether an air of mystery? Nevertheless nothing is truer. Those who know Hübler's method, understand why it is so and not otherwise.

Gotha, Aug. 11, 1860. VON BERLEPSCH."

"The foregoing having been read to the society and they having full confidence in Mr. Hübler as an honorable man, charged their Secretary to write to him, offering to pay him for his printed directions, and if the process proved efficacious, they resolved to award him a valuable premium. One of the members feared there might be some *Rareyism* in the process; but he was open to conviction and wished for light on the subject."

We hope those who have experimented in raising and introducing queens, will make known their success, in time to benefit others the coming season. E. P.

☞The process of safely introducing a queen, referred to in the above communication, was thus described by Mr. Hübler, at the late Convention of German Beekeepers, in the city of Hanover:

"When a queen is to be introduced, the bees of the colony are previously to be stupefied with the fumes of the common fungus, known as puff or puck ball (*Lycoperdon bovista*). When the bees cease humming and drop, the hive is opened to admit fresh air; and the queen to be introduced is then placed on the stupefied mass, into which she will immediately creep and remain quiet.

The following particulars are to be observed:

1. The operation should be undertaken only in the evening, shortly before dusk, and the entire mass of the bees be exposed to the fumes of the fungus.

2. The stupefied bees must not be confined while reviving, or feel as though they were under restraint, or they will commence fanning violently and many of them die from exhaustion.

3. It is not safe to stupefy bees in the spring, til after they have had an opportunity to fly and discharge their fœces, or they will soil themselves while in a state of stupefaction. At other times they may indeed disgorge the honey with which their stomachs are filled, but this does no injury.

4. When a virgin queen is to be substituted for a fertile one, the colony must first, by the removal of the latter, be made to feel its queenless condition, and the consequent excitement be allowed to subside.

5. It is not necessary that the offered queen be confined or protected.

6. When a drone-breeding colony is to be operated on, no special preparation is necessary. It may be fumigated at once, and the queen placed on the fallen cluster. But I have, in such cases, never offered any other than fertile queens. Whether a virgin queen would be accepted, I am unable to say.

7. Fumigation with this fungus is the readiest and safest mode of strengthening colonies, by the introduction of bees from other hives. They will be received without hesitation.

8. I do not think it advisable to fumigate bees late in the fall, when they may have no opportunity to fly out after the operation. It seems to me that bees fumigated so late in the season, do not winter as well as others.

9. I have not obtained favorable results when I used other substances for fumigation.

In August, 1859, I transferred a colony from

one movable comb hive to another. After lifting out the last comb, about a thousand bees remained in the hive. I intended to give them a young Italian queen, and as they were much scattered and I did not wish to brush them together, I fumigated them and cast the queen among them to see how she would fare. Next morning I found her hale and active among her companions, and the old queen, undesignedly present, lay dead on the bottom board. The young queen soon became fertile. Future experiments will doubtless lead to the discovery of other singularities."

Thus far Hübler. We would remark that great caution is indispensably required in the fumigation of bees with puck-ball fungus, or they may be stupefied *beyond recovery*—literally suffocated.

Years ago, Mr. Suda, a correspondent of the Bienenzeitung, must have been on the verge of discovering this mode of introducing a queen. We find the following passage in an article "on the changing of queens," written by him and published in that Journal for Nov. 1, 1853:—

"If I had had fertile young queens at my disposal at the close of last summer, I would have tried the experiment of stupefying, with the fumes of puck-ball, a colony containing an old queen, and thereupon introducing among them a young one in company with a small body of workers, to ascertain whether these would not have maintained the upper-hand."

Possibly Mr. Hübler took a hint from this.

☞Bees will gather *honey* from different species of plants or flowers, during the same excursion—passing freely from one kind to another. But they confine themselves to one and the same species when collecting *pollen*. It is easy for an observer to satisfy himself of the fact that a bee is gathering honey *only*, from some flower or blossom; but when he sees a bee collecting pollen, it is not so easy a matter for him to assure himself that she is not gathering honey also.

☞There are for the bees three harvest seasons in every year—spring, summer and autumn. If only one of these yield abundantly, the bees will secure a supply for all their prospective wants; and so likewise if all three are only moderately good. When they can gather plentifully during two of them, they secure a supply and a surplus; and when all three yield amply, there will be a superabundance of stores. As a general rule, destitution and starvation will only occur among bees which are diseased or mismanaged; especially when by improper or excessive pruning in the spring, they are constrained to use for comb-building, the avails of the early harvest and the later ones prove to be meagre.

[For the "American Bee Journal."]

It is interesting to know at what height above the level of the sea, bee culture may be successfully prosecuted in any country. The following is a list of places in Thuringia, at which the business has been many years pursued with profit; with their elevation respectively above the level of the German ocean.

Jena,	450 feet.
Rudolstadt,	624 "
Schwarza,	648 "
Blankenberg,	681 "
Swalfeld,	718 "
Weimar,	721 "
Watzdorf,	755 "
Leutnitz,	806 "
Upper Rottenbach,	878 "
Eichfeld,	889 "
Solsdorf,	900 "
Arnstadt,	903 "
Leutenberg,	921 "
Lower Wirbach,	929 "
Teichel,	958 "
Köditz,	969 "
Miltiz,	971 "
Thalendorf,	972 "
Ziegenheim,	985 "
Little Görlitz,	1031 "
Lower Weissbach,	1033 "
Great Görlitz,	1049 "
Schwartzburg,	1070 "
Keelhau,	1098 "
Allendorf,	1100 "
Paulinzella,	1108 "
Königses,	1158 "
Bechstedt,	1200 "
Lichstedt,	1222 "
Hengelbach,	1310 "
Katzhütte,	1337 "
Böhlscheiben,	1491 "
Upper Wirbach,	1602 "
Upper Hayn,	1790 "
Meura,	1800 "
Braunsdorf,	1904 "

At the place last mentioned, twelve colonies produced 108 lbs. of honey and 22 lbs. of wax, in 1853. The bees were kept in ordinary hives, managed on the *nadiring* system, and were not treated with any special skill or attention. A more judicious mode of management would unquestionably have insured a greater yield; for, at periods when the bees in the valley below could gather very little, those at Braunsdorf had the most abundant pasturage. The general complaint there, is that the bees rarely swarm.

[For the "Bee Journal."]

Nov. 30th, 1859, I put thirty-six swarms of bees into a clamp made by digging a trench 3 feet deep and 2 ft. 6 in. wide. Over this trench, strips of plank are laid to support the hives—three on the lower tier, two on the second and three on the top. Boards about seven feet in length are set upon the ground, forming a roof about six feet in height. The boards are then covered with a thick coating of hay, over which five or six inches of dirt is thrown and suffered to freeze. After freezing, another coating of hay is put on. The ends are covered in the same way, forming a hipped roof. Near the bottom of each end is inserted a length of drain-pipe 5 inches in diameter, or a wooden box 4 or 5 inches square, and at the top, one of 2 inches. These serve for ventilation and to insert a thermometer to ascertain the temperature of the clamp. The openings at the bottom are to be closed during the coldest weather.

On the 16th of March, 1860, I opened the clamp and took out the bees, having been confined 108 days. Of the 36 swarms, five died. I weighed eleven swarms, when I put them in and when I took them out. They had shrunk in weight 78½ pounds, averaging a little over seven pounds per swarm. The clamp was too small; the hives being packed as close as they well could be. The ventilation was not sufficient, and some of the last days they remained in, the thermometer rose to nearly 60°. In some of the hives the bees became restless, and many dead bees were found on the bottom boards. The thermometer, through the cold weather, was from 34° to 40°. My bees, not in the clamp, consumed a much larger quantity of honey than those in the clamp. The majority of the swarms were in the Langstroth hive.

Dec. 1st, 1860, I put sixteen swarms into the same clamp, and gave them more ventilation than last year. These I did not weigh. I opened them March 29th, 1861, having been in 119 days. Of these, four swarms died. The thermometer ranged from 30° to 42°. Some of the combs near the bottom and sides of the hives were mouldy; but most of these were strong in bees. About half of these were Italian queens impregnated by common drones.

On the 4th of Dec. I put fifteen swarms into another clamp, and ventilated them still more. All of these I weighed, both at the closing and the opening of the clamp. I opened them March 30, 1861, having been in 117 days. One swarm I found dead. The remaining fourteen weighed 84 pounds less than when put in. The average consumption was six pounds per swarm—varying from 3½ to 12½ pounds. The thermometer ranged in this clamp from 28° to 40°. All of these were hybrid queens, with the exception of one pure Italian, which I obtained from Mr. Parsons of Flushing, N. Y., the 20th day of last July. I converted the most of my stocks from the common to the Italian queens after that time. The Italian queen laid no drone-eggs after I got her; and I was compelled to go in for hybrids alone. I think I took away from her, eggs and brood enough last fall, in raising hybrid queens, to make two large swarms. I had to feed my bees while raising the hybrid queens; which I did with syrup, made of Havana sugar. Many of my stocks became reduced, while experimenting last fall. The hybrid queens that had a full stock of bees, had sealed brood and eggs in abundance, when I opened them this spring. My pure Italian queen had eggs, but she had not as much brood as some of my hybrid queens, which had a larger stock of bees.

One Italian queen, which I kept in the house, died in the winter. While taking eggs from this queen in October last, I found a queen-cell sealed. This I took out and gave to a nucleus, which raised a queen from it. A short time after, I found another queen-cell sealed.—This I also removed. I considered it very anomalous at the time, that a young queen, and one also very prolific late in October, should make preparations for a successor. She appeared well and active, and remained so the first of the winter; but on opening the hive in February, I found her dead. *Query?*—Had she not in October premonitions of disease, and did not instinct teach her, at that uncommon season of the year, to provide for the emergency her swarm met in the midst of winter? She was introduced to a common stock of bees sometime in August last. Much brood and eggs were taken from her for nuclei. Still the great majority of the swarm, on going into winter quarters, was Italians. When I found the dead queen, I noticed there were but few Italian bees among the dead, while the living seemed almost all Italians. I had the curiosity to count them, and out of more than one thousand there were not fifty dead Italians. Many stocks of bees have been lost this last winter; and some strong stocks, not in clamps, with plenty of honey, have died.

HORACE P. WAKEFIELD.

Reading, Mass., April 6th, 1861.

☞The bees do not deposit in the cells all the pollen they gather. Many of the pellets are taken from the gatherers as they return with laden thighs, and are at once consumed by the greedy workers, to qualify themselves for secreting wax or preparing food for the older larvæ.

Movable Frames.

Several of our correspondents have inquired whether the frames in movable comb hives should not be permanently fixed at some definite distance apart. Our own experience has taught us, that such precision and uniformity are at least not indispensable, and are indeed to some extent impracticable, without interfering unduly, at times, with the operations of the bees. It has been supposed that the proper distance could be determined, by ascertaining that which the bees instinctively adopt in ordinary hives. But investigation has shown that the bees observe no uniform rule or practice in this particular. Dzierzon found many remarkable deviations, and says that though the usual average for brood combs is 1½ in. (Silesian measure,) apart, yet in a large number of oblong hives which he inspected, the average was 1⅔ in., measuring from the middle of one comb to the middle of the next. Mr. Wieprecht examined eight colonies in common hives, and ascertained by measurement, that the distance at which the combs were placed apart, was different in all of them. The average distance apart of all the combs was 1¼ in. (Rhenish measure), and of the brood-combs 1 7-16ths in. This, except as to the brood-combs, differs considerably from what is usually supposed to be the arrangement in such hives—namely, that the store-combs are placed farther apart than the brood-combs, when bees are free to follow their own instincts. It shows also that the distance apart at which frames for such combs are usually set in movable comb hives, is slightly greater than that which bees naturally prefer and would adopt.—Dzierzon directs the bars with guide-combs to be placed 1½ in. apart, from centre to centre; his inspection of numerous hives and long practice having taught him that such was *about* the proper distance for brood-combs. His inch, however, is Silesian measure, of which 13 inches make a Rhenish or English foot—thus giving very nearly the same distance apart, for brood-combs, as ascertained by Mr. Wieprecht (1 7-16ths in.). According to Dzierzon's latest remarks on the subject, the top of the frames should be one Siberian inch in breadth, and the intervening space one-half inch or the depth of a worker-cell in new brood-comb. Yet, extreme accuracy is not required, as the bees manifestly do not observe it themselves. In parts of the hive where store-combs are usually placed, still less precision is necessary. Either four or five frames may be arranged in a space of seven inches, as thicker or thinner store-combs are desired. Thick honey combs are usually preferred; but thin ones are more conveniently handled.

It follows, of course, that the width of a hive need not necessarily be adapted for a given number of frames set at precise distances apart. The same number of frames cannot always be conveniently used—owing to casual circumstances which cannot be foreseen. Thus, in making an artificial colony, it may be desirable to supply it with honey in the comb, when none but thick honey combs are at hand. We may hence be constrained to arrange the rest of frames differently from what we might prefer, and be able to use only eleven in place of twelve.

[For the "Bee Journal."]

As it is time to feed bees, and there are many hives needing this help, I would like to ask through the Bee Journal, what is the best kind of food and the best way to give it. If some one with experience in this matter would give us all or nearly all of the *particulars*, it would greatly assist many. Is not a particular kind of food more suitable at one season than at another, and would there not be a difference in which part of the hive to place it? If good coffee sugar, slightly moistened, is the best for spring, it has just occurred to me, that it could be best fed to bees in gums or the common box hives, by means of a cylindrical box made of wire cloth or perforated tin. Let it be 1¼ inch in diameter, and 4 or 6 inches long, the top open with a flare or shoulder to hold the box to the top of the hive, through which it enters by means of a 1½ inch diameter hole. When the box is adjusted, (by breaking away comb sufficient to let it enter,) fill it with sugar, and cover with a woollen cloth weighted down by a brick. Thus the food is offered at the inside of the hive, to the mutual convenience of the feeder and the fed.

Jacksonville, Illinois. H. T. Collins.

☞A singular buzzing is sometimes heard, even late in the spring, in young and healthy colonies which have much brood to nurse. This is no evidence of feebleness, but that they are suffering from cold. To be able accurately to judge of and interpret the peculiar buzzing of bees at various times and under different circumstances, is no slight acquisition. He who can do it promptly and correctly, has mastered many of the arcana in the economy of the hive.

☞Bees do not consume most honey during extreme cold weather, but during intervals of milder temperature.

☞Colonies which have a vacant space below the combs, will winter better than those whose combs extend down to the bottom board.

Curious Cases.

Dzierzon observed a second swarm issue from a colony whose recently emerged queen he had removed a few hours before, and which contained only an embryo queen in a royal cell. He inferred that the bees, being ready to swarm, had not yet discovered the absence of their queen when they issued. It would seem from this also, that the signal for swarming is not given by the queen.

Mr. Kaden saw a swarm issuing a second time, from a hive which had swarmed on the previous day and lost its queen. Probably the mass of the bees remained in ignorance of their loss, and issued under an impression that the queen would follow.

Mr. Vogel reports a case where a colony exhibited signs of queenlessness, though actually in possession of a queen. This was undoubtedly caused by an attack made on the queen, endangering her life. Such attacks are sometimes made by strange bees, which enter the hive either by design or mistake. Under such circumstances, fearing the worst, bees will frequently start royal cells before they become composed or assured of the queen's safety.

Bees have retentive memories. Dzierzon once gave a fertile queen to a bereaved colony, and she speedily supplied all the brood-combs with eggs. He discovered soon after, that she had been killed; and introduced another, which encountered the same fate. He examined the combs and found a young queen just emerged, which had been reared from eggs or brood furnished by the first queen. The bees remembered their previous destitute condition, and took to rearing a queen as soon as supplied with requisite means.

The following occurrence took place in Dzierzon's apiary several years ago. One of his hives sent forth three strong swarms at intervals of about five days, though there was, meanwhile, not the slightest interruption in the laying of eggs. During the whole period, as well as afterwards, the combs contained eggs, larvæ and sealed brood, just like any healthy, strong colony that does not swarm. Here the old queen resolutely maintained her ground, and thus compelled the young ones, as they successively emerged, to accompany the swarms. Such cases are by no means rare. But suppose she had chosen to leave with the third swarm, and having crippled wings, had fallen to the ground and been found there by an inexperienced or unreflecting beekeeper, would he not have inferred that queen bees are fertile when hatched? Isolated cases may prove deceptive and misleading. Only the repeated observation of uniform phenomena, can form the basis of correct and reliable conclusions.

From the "Wabash Gazette."

One of the many remarkable sights here on the Fourth, was Mr. Twining and his Queen bee. He came into our office the day before, with an old plug hat. He had cut two holes in it about midway of the crown—one in front, the other in the back part. Holding the hat in his hand, and turning it over to show that it was empty, he said "you see that this hat is now empty. To-morrow I intend to have a swarm of bees at work in it, making honey, and I intend to wear it on my head with the bees in it!" Sure enough, on the Fourth, as were going out into the grove, we came across Mr. Twining. He was located under a shady tree, and was exhibiting to an admiring crowd of men and women, his wonderful patent bee hive. On his head was the identical hat that he had shown us the day before. It was literally covered all over with bees, busy at work, going in and out at the two orifices before mentioned. All the spare space in the hat was filled with new comb, that had been made within twelve hours. In his hand he held the Queen bee which he was showing to every one who would venture near enough to gaze on and admire the wonderful little insect. During all this time he was giving an eloquent and instructive lecture on the habits, worth, and care of bees. After listening for some time we left, feeling that what Twining did not know about bees was hardly worth knowing.—*July*, 1860.

☞Is not the opinion prevalent that bees station guards at the entrance of their hives, erroneous? Feeble colonies, and recent swarms domiciled in hives disproportionately large, have no such guards posted, though they, if any, would need them. When bees of populous hives well stocked with combs, are seen collected about the entrance, fanning, clustering, &c., is it not rather because ventilation is needed, or they are prevented from laboring within by the internal heat, than because their vigilance is required for the protection of the colony? True, when a hive is annoyed or attacked, hosts of workers promptly make their appearance at the entrance, evidently intent and prepared to repel assailants. But this is an occasional occurrence, having an obvious special cause; and is as transient as it is rare. Nor does the fanning party then participate in those martial demonstrations, but continues the ventilating operation with most intense devotedness and zeal.

☞There is a decided difference among bees as to industry in comb-building and honey-gathering, even where the location, weather and management are the same.

[From the Ohio Farmer.]

Beekeepers' Convention.

Thursday, March 14th, 1861.

Met in the Sons of Temperance Hall, Cleveland, Ohio. The President, Prof. J. P. Kirtland in the chair.

The first business being the election of officers, it was on motion postponed until two o'clock P. M.

The President, from the Committee to secure further legislation on the subject of increased protection for beekeepers, reported, which report was laid on the table until next day.

The question for discussion was that agreed to at the last meeting, "*What is the best form of hive?*" Which, on motion of J. Kirkpatrick, was divided so as to read "*whether hives with or without movable frames are best,*" and then, "*which hive of the two kinds is best.*"

J. Kirkpatrick opened the debate by saying that he was not prepared to bring anything new on the subject before the Association, and to his mind it seemed that anything said in favor of movable frames was superfluous, but would refer to the increased facilities in manipulating the bees, the increase of swarms by division, and the power to supply a queen, if one is lost.

Mr. Smith thought that division was unnatural; he admitted, with the previous speaker, that it may be overdone; that dividing by the natural method is the best. If the beekeeper, especially a new beginner, would first obtain experience with the stationary comb, before using the movable frames, it would be much better. Removing combs from the centre of the hive at certain times was very injurious, and inexperienced beekeepers were apt to do this. Intelligent beekeepers act differently.

S. C. Brown. I never lost a swarm of bees, except through carelessness, since I began to use the frames. Leaving things to nature will not always be for our interest, as we milk cows, shear sheep, &c., yet all are unnatural. The simplest form of a hive—for example, a hollow log—is the nearest nature, but is not the best or most profitable. My experience with movable frame hives is very favorable. As an experiment, I increased fourteen stocks to thirty-eight in one season, all of which did well, and produced a large quantity of honey.

Mr. Smith. Experience is necessary to success in using movable comb hives. He makes his bees pay good interest. He believes it the interest of every beekeeper to let his bees swarm naturally. It is not natural to divide hives by taking out a sheet of comb, and form a new colony before the proper time. They should be allowed to "secede" at their own time. New beginners, if they commence with the supposition that they can make any number of swarms by division, will lose more than if they let nature do the work. In answer to the question, "what is a proper sized hive?" he said, a proper sized hive, in my opinion, is one that will hold one bushel. If it is larger, the queen will not lay eggs sufficient to fill it. This has been tested by experiment.

S. C. Brown wants to know if it is "natural" to hive bees at all, or domesticate them. If it is natural to divide our cattle or sheep, why not our bees? It is no argument against certain hives that they are abused. I have used numerous kinds of hives, and followed nature till I was not able to keep my colonies good, and was forced to change.

J. Kirkpatrick. This idea of a state of nature, is not the question. Domesticated bees and cattle are not in a state of nature. The inexperienced man generally loses in whatever he undertakes. No other form of hive, except the movable frame, allows us to increase our swarms easily by artificial means; that we do this too rapidly, is no argument against the hive. To take comb from the centre of the colony, may annoy the bees, but this is of small account. We take the calf from its mother, because it is for our, and not their good. Several new hives are patented every year, which is evidence that there is a demand for new forms, giving greater control of bees. Every one admits that with movable frame hives, beekeepers are enabled to keep good the number of their swarms.

Mr. Sturtevant thought it was going backward to advocate the claims of the old box hive.

Dr. Kirtland. The object of our association is to elicit information about the culture of bees. We are living in an important epoch, so far as bee culture is concerned. Four years ago, after having tried almost everything, I contracted for a number of old box hives, and determined to go back to first principles; at that time, I was convinced the old-fashioned hive was the best. Four years' experience with movable comb frames, however, has convinced me that we have since made important advancement. There were no bee moths in the country till the commencement of the present century, and before that time bees did well *anywhere*. Since that, the moth has made beekeeping almost impossible. Patents had been devised to prevent injury from them, and before the movable comb hive no advancement had been made. I have been testing these hives, and insist they have made an entire change in bee cultivation. Till now, it was almost impossible to keep the number of your bee colonies good. Under the movable comb principle we have bee, honey and comb entirely under our control; you can look at, or handle them, and detect or remedy any want. This you cannot do with other hives. With movable frames I can discover anything wrong about the hive, without *guessing*—perhaps the queen is old or dead—you can discover it, and supply the worker-eggs for a new one, or a young queen. This alone is an important gain. Queenless colonies are numerous. In summer, your queen is liable to be destroyed, but you can detect it at once. Dividing swarms is no doubt overdone. Two years ago, I did it just right, but last year I divided them too much, and some of them are weak. I made three Italian colonies from a mere nucleus, which are now very heavy. *Could have done it in no other hive.* Ten or fifteen years is about the life time of a swarm in an old-fashioned hive, but in the movable frame hive a colony *never* becomes old. It is a perpetual corporation.

The census of the amount of bee colonies in different parts of the State, prove that there has been a great increase in number within a few years, and it is greatly owing to the movable comb frame hives. In no instance do I find large numbers of colonies belonging to persons without movable frame hives. They are as superior to

the old-fashioned bee hive as the threshing machine is to a flail.

Mr. Sturtevant. I know several large beekeepers who use Wicks' hive, but they are coming over to movable frame hives. It is a mistaken notion that we need more experience to use the movable comb hive than the old-fashioned box hive. By using brimstone, of course we can find out what is the matter with an ailing colony, but then it is too late to save the swarm. Men lose colonies in movable comb hives, and we always hear of it; but nothing is said of the numerous colonies destroyed in the old hives. Many are unwise, and carry the matter to an extreme in dividing swarms, but the principle is good, even if abused. It is intelligent care that gives success in bee culture, and this is only obtained by the movable comb hive.

Mr. Otis. Four years ago, I came to Cleveland to introduce the Movable Comb Hive, and met with cold rebuffs. The best men wers sick of patent bee hives. To-day, I am happy to find a different state of feeling. A large portion of the people of France use no other sweet than honey; indeed, this is the only sweet a large portion of the human race ever taste. It is the best and most natural of sweets. The strongest instinct bees have is to store honey; the next is the love of their offspring. One of the greatest hindrances to success is a surplus of honey. When this is the case, there is no room for eggs, and without them the stock soon becomes extinct. When weak, the moth enters the hive and finishes the work. They do not do this to injure the bee, but for food and heat to hatch their eggs. The moth is small and active; has bat's eyes, and works in the night; but you cannot entrap her in moth catchers. If she cannot enter the hive, she will deposit her eggs in the nearest place, where heat can be obtained, and bees carry them in themselves. I think bees carry more eggs into the hive than moths ever deposit there. Now we want a hive to give us control of the swarm, to prevent too great increase of honey, and injury by moths. The frames, while they do not injure the bees, give this control. It makes no difference whether the cavity for bees be a hollow log, a box, or a frame hive, but for their control it makes a great difference. Division of hives should be made at such times as bees can get material to work with; at other times, you remove comb that the queen might use in which to deposit eggs, and may result in other injury.

AFTERNOON SESSION.

Mr. Merriman is in favor of the movable comb frame hives. Formerly he was in the dark in regard to the best treatment of bees; but since the introduction of this hive, he feels as if he had got quite near to the light.

Mr. Smith had succeeded in supplying queens to hives destitute of them in the fall, by driving a weak, late swarm, having a queen, into the queenless hive.

Mr. Kirkpatrick would ask Mr. Smith how he would supply a queen in spring to a queenless colony?

Mr. Smith would in such case prefer a movable frame hive.

The discussion on this subject being then closed, it was

Resolved, That it is the opinion of this Association, that hives with movable comb frames are the best for beekeepers. Carried unanimously.

The second question, "*Which is the best form of the Movable Frame Hive?*" was then taken up and discussed.

Mr. Otis said he would give his opinions of a good bee hive. We have had numerous forms, but most of them have been failures. I will hear no man's opinion as to the best form, but go to the bee to determine. So far as the bees are concerned, the bee can store honey in one cavity as well as another; but in controlling them, there is much difference. The strongest instinct of the bee is to store honey. They cannot resist this disposition. A swarm of bees in May comes out at just the time to do well. The old saying "that a swarm in May is worth a load of hay;" "in June, a silver spoon;" "in July, they are not worth a fly," is very nearly true. A hive should be a simple cavity. All divisions in it do harm. The general opinion is, that it should contain about 2,200 square inches of comb surface. Why this is so, I think is because it gives sufficient room for the queen to deposit her eggs, for bee bread and a little surplus honey. The queen lays about three thousand eggs in a day. They hatch in twenty-three days. During this period, the queen will have filled most of the spare cells in a hive of this size. After one brood hatches out, the same cells can be used again for depositing eggs. For wintering bees, the form of an old-fashioned churn inverted, is perhaps the best. The queen lays her eggs in the highest empty cells, to take advantage of the ascending heat. Boxes for surplus honey should be placed on the hive as soon as heat can be spared from below to admit of it. These should be made small, so that the cards of honey will be of the right size for the table, and so that they can be removed at any time without too greatly shocking the bees, which is always the case if the boxes be large. With several small boxes, one can be taken away at any time without injury. This is why Mr. Langstroth uses small, instead of large boxes on his hive.

Mr. Flanders was in favor of the triangular form. It assists materially in keeping the hive clean. Cleanliness prevents the moth from doing so much injury. Strong odors and filth attract them. By using reversable comb frames, he could change the working economy of the bee, but not their instinct. He had yet to see combs on the triangular frame built irregularly.

Mr. Merriam stated that he had frequently seen irregular comb in such frames.

Mr. Kirkpatrick stated that he had used Langstroth's hive for several years, and it had met his expectations in every respect. The triangular hive allowed the manipulator to do several things, but are these things necessary?—There is no need of reversing the frames, for the bees are always clustered around their brood, and this secures sufficient heat; indeed, reversing the frames fails to secure extra heat, as intended.

Mr. R. C. Otis said that comb is always more or less irregular in form. Bees make it so, to secure greater strength. Comb for brood always has the same depth; for honey it has not. When a frame is once filled with good brood comb, it will last for years. I have reversed frames in hives, and could never induce queens to deposit

eggs in them. I believe such a course will ruin any colony. Any place in a hive, where a worm can find harbor, and the bee cannot follow, is objectionable. The queen will never go to a surplus honey box to deposit eggs, if all is right below. It ought to be understood that no form of hive will do for bees what was intended that man should do for them.—We can make steam engines and intricate machinery, but it won't run of itself; so with bee hives; the best of them must be looked after, and kept in good condition, or failure is certain.

Dr. Kirtland said that in twenty-three of Langstroth's hives, placed in a cellar this winter, with only three holes for ventilation, and closed at the bottom, he found sufficient carbonic acid gas accumulated to extinguish a candle. This gas is so heavy that it sinks to the bottom of the hive, and here I found a good many dead bees. This fact may be useful to patent hive makers.

Second Day's Proceedings.

The question of wintering bees was temporarily taken up this morning.

S. C. Brown said that, on Nov. 26th he buried several swarms, and took them out March 1st.—They had no ventilation, except through a covering of boards, earth and straw. The bottom of the hive was closed; on opening them, he found some power had pushed the blocks closing the bottom of the hive forward, so as to admit of the passage of air. He found them very strong, with few dead bees, and they had eaten less honey than bees above ground. His conclusion was, that bees properly buried are safer, give less trouble, and no anxiety. The uniform temperature kept them very quiet, which is very important. He wintered fifty hives in a house lined with straw. On Feb. 1st, he took them out to void excrement and replaced them till March 1st, but should have removed them a few days sooner, as they had become very uneasy. He found those hives placed on the floor did not do as well as those on the high shelves.

Dr. Kirtland suggested that the reason of the blocks closing the hives, being pushed forward, was, by the pressure of accumulated carbonic acid gas. It may have also been the cause of injury to the bees on the floor in the room lined with straw.

Mr. R. C. Otis said the beekeeper should always ask the *why* of any of his failures. There is a *cause* for all of them, and if we ask this question, we shall soon discover it. He keeps his hives closed at night, and at all times when it is not proper for them to go out. In this way an even temperature is secured.

Mr. Ely. I have wintered in the dark, in the light, out of doors, and buried. The three swarms I buried, were weighed in the fall, and this spring, when I took them up, I found two swarms weighed eight, and one seven pounds less than before. Of two in the open air, one lost fourteen, and the other twenty-one pounds; those in a cold, light room lost fourteen and a half pounds; my buried bees came out in *fine* condition. The soil was a clay loam, and they were well covered with boards and straw. I took them out March 13th, but it would have been better had I let them remain till April.

Mr. Merriam wintered his bees in a bee house. Those on the north side did best, and there they also made the most honey. They do not go out unless it is sufficiently warm to admit of it.

Mr. Sturtevant wants this question of carbonic acid injuring bees sifted. This gas is very heavy and sinks to the lowest point. Now, I ask Dr. Kirtland how near he brought the candle to his bees?

Dr. Kirtland. I am engaged in fifty problems relating to bee culture, and this winter I put twenty-five of the weakest colonies I had into a dry cellar, also three full and three half-blood Italian swarms. I gave ventilation at the top, but closed the bottom opening. I watched them closely, and found in the bottom of the hive too many dead bees. Placing the candle near the opening, found it nearly extinguished, and I found where the bottom was closed, there was the most carbonic acid and dead bees. Removing the blocks that closed the bottom, this gas did not accumulate, and there I found less injury. Bees breathe, and in their emanations is also found carbonic acid in considerable quantities. I think this a point that has been overlooked in the construction of Langstroth's hive. Where the hive is out-doors, there is less danger from this source.

Mr. Sturtevant. I apprehend there are other things than this gas that injure bees. They must have oxygen, and if placed in a tight hive, soon use up what they have, when they have only nitrogen, carbonic acid, moisture and emanations, and these are as injurious as this gas. My bees, when their hive is open below, have become uneasy when the thermometer reached 40 deg., and have dysentery; this is cured by their having a current of air passing through the hive. Where they had only ventilation at the top, they did not get this condition. His experience is different from that of Dr. Kirtland, and he lost less bees in his hives that were tight at the bottom and open at the top. He admitted that when the oxygen is obstructed, bees cannot live, and in proportion as it is obstructed do they become unhealthy. I use a bee house, and the coldest or north side is the best, both for wintering bees and making honey. One of the most important things in wintering bees, is an equal temperature. On the cold side of the bee house, my bees did not go out at all till the weather became sufficiently warm. When plants furnish pollen for them, they start just as early on one side as the other. Here we have a good deal of S. E. winds during the season for bees to work, and this is very annoying to them. Bees swarm just as early, then, on the north as the south side. I, however, think less of early brood than many do. If you can keep your bees frozen up until April, all the better. January or February brood is not worth talking of. When you bring them out, you want them to go right to work.

Dr. Kirtland. That the air in a bee hive may be contaminated, I have had experience enough to know. I once smothered two colonies of bees on a warm summer day, by closing for a few hours the hives. At least three-fourths of the air in such a hive will be carbonic acid, the rest azote, etc. Last fall, I closed up a hive of my best Italian bees for a little time, and lost a large number of the colony. These facts showed to me that great care in ventilation is necessary. I shall not desert my cellar in which to winter bees; I think

the results about the same as those of Mr. Ely, who buried his bees. I am convinced that we can economize honey by keeping them at an equal temperature.

The question, "Which is the best form of hive?" was now taken up.

Mr. Otis. We ought to discard the idea that our barns will take care of the cattle, or our bee hives of our bees. Mr. Langstroth adopted his form after long experience. The shallower and broader we have the frame, the faster we can breed; five inches deep is enough, but if too shallow, bees will not winter well. Within a few years several patent movable frame hives have been invented, differing little from his. Mr. Otis here gave the points of Mr. L's hive which are patented, and stated that many hives are patented, the patented part being of no value. All the *forms* of movable frames sell on the strength of Langstroth's patent. It is wrong to recommend those forms, to the injury of the man who has performed the greatest benefit to the country. He who buys a patent hive should know first whether the useful parts of it are patented. In regard to wintering bees, I believe the best plan is a rick covered with straw and dirt, with holes for upward ventilation, and kept just above the freezing point. I would leave them in this condition till plants furnish pollen for them, if possible.

SECOND DAY—AFTERNOON.

The subject of bee hives was continued:

Dr. Kirtland said that he had only two forms of hives; one Langstroth's, and the other Flanders'. I have expressed no preference for either of them, and have not tested the Flanders' hive, but shall do so as soon as I have an opportunity. I would not give a snap of my finger for most of the fine model patent bee hives which have been presented to the public.

Mr. Otis. The amount of money that will be expended within six months in purchasing hives will be large, and it is important to know which form is best. The decision of this convention will be looked to with interest.

Mr. S. C. Brown said that his experience with the Langstroth hive indicated that it was too shallow. If I make them deeper, however, I cannot remove the frames, on account of the moving of the comb. One objection to the triangular frames is that there is not sufficient room for brood. It is stated that the inclination of the sides facilitates cleaning of the hive, but that is unnecessary, for bees are not sluttish in their habits.

Mr. Otis said he had made great improvement in his colonies, by selecting the most perfect queen cells. Those which are small should never be used. We can improve bees as well as cattle.

Dr. Kirtland said this was no doubt true. He once used a small queen cell to start a colony, but the queen was very weak.

After the discussion, the following resolution was adopted:

Whereas, That at this meeting of the Beekeepers' Association, there were but two forms of movable comb hives exhibited, the Langstroth Movable Comb, and the Flanders' Triangular Self-Cleaning Movable Comb Hives—

Resolved, That the majority of the members of this Association have tested the Langstroth Hive, and are satisfied that it gives the apiarian entire control of his bees, and is worthy of adoption by all beekeepers. That the Flanders Hive has not as yet been tested so as to enable the members to give an opinion of it, based on practice.

It was also Resolved, That this convention recognize the importance of a Bee Journal for apiarians, and that we recommend to beekeepers the "American Bee Journal," published at Philadelphia, Pa., by A. M. Spangler & Co.

At the close of the meeting, Dr. Kirtland read an address on the Italian Bee.

Mr. R. C. Otis gave an interesting account of the copulation of a queen bee. She came out of the hive, circled high up in the air, was absent about thirteen minutes, when she returned. The hive had been closed in her absence, shutting out a drone in front of the hive. When she came back, this drone flew rapidly to her, clasped his legs about her, when an explosion was distinctly heard, and the drone fell dead to the ground, his abdomen being contracted, and the organs of generation recurved over the back.

The Convention adjourned until November 21, 1861, at which time a large number of persons from abroad will doubtless be present.

AMERICAN BEE JOURNAL.

Philadelphia, May, 1861.

TO CORRESPONDENTS.

We have on hand some very interesting communications, queries, &c., which shall be attended to at the earliest opportunity.

TERMS OF THE BEE JOURNAL:

Single Copy, - - - One Dollar.
Five Copies, - - - Four Dollars.
Ten or more copies, Seventy-five cents each.

Each Dollar Subscriber will receive a prepaid copy of either the "*Year Book of the Farm and Garden*," or of "*Both Sides of the Grape Question*," as a premium

REMITTANCES.

Those who wish to remit money for subscriptions are respectfully requested to observe the following suggestions:—

Give the Name, Post Office, County and State in full. Write them so plainly that they can be read with ease.

In sending money we prefer gold. Gold dollars can be sent with safety, if fastened to the letter sheet by having a small piece of paper glued or pasted over them.

The notes of all solvent banks will be taken for subscriptions.

Monthly Management.

MAY.

Alike for the lover of bees and the admirer of nature is the flowery month of May one of the most delightful periods of the year. The colonies are now steadily and rapidly increasing in strength and displaying the most unremitting industry.—Even in the northerly sections of the country, drones generally begin to make their appearance about the middle of this month; and in more favored localities early swarms will issue. The blossoms of the fruit trees furnish abundant supplies, and attract crowds of eager gatherers. The hum of busy hosts resounds from dawn till dusk, and the air is vocal with the music of "toiling millions." But in some districts this is a transient joy, succeeded by inaction and gloom. In these, before the lindens blossom and the white clover comes into flower, there is an interval during which pasturage is scarce. Where this occurs, colonies—especially such as are strong and have much brood—will need regular feeding, to keep them in a prosperous condition. Swarms can there seldom be expected to issue before mid-summer; and if timely feeding has been neglected, the season may pass without favoring us with a natural increase of stock. Where bees are kept on isolated stands, remote from other apiaries, the necessary feeding may be conveniently done in the open air, by offering them supplies of diluted honey in small troughs, shallow dishes, or old drone-comb. But if other bees are kept in the vicinity, or the weather prove unfavorable, this mode of feeding cannot be resorted to without waste and loss. In such case it is better, after the fruit trees have ceased blossoming, to make artificial colonies, and appropriate the needed food to the support of these.

Artificial colonies may be made as soon as sealed drone-brood can be seen in the more populous hives, because drones will then be sufficiently abundant when the young queens have matured and begin to make their hymeneal excursions. If a few of the stronger stocks, especially such as have much drone-comb, be selected and divided early, by drumming out a swarm from each, a large number of supernumerary queens may be procured in the course of from ten to fourteen days, and an excessive production of drones be prevented for that season in such colony. These young queens, or the royal cells containing them, may be used with great advantage in forming artificial colonies.

A fertile queen obtained during the interval of deficient supplies, is still highly valuable, as she is able to produce a large number of workers which mature in season to appropriate the nectar of the lindens and white clover. And in fact, the worth of a weak colony, preserved over winter with much care and difficulty, consists almost entirely in its fertile queen, qualified to furnish a numerous progeny early in the opening season. The advantage of possessing fertile young queens (more to be prized than old ones of previous years,) need hence scarcely be adverted to. Even a feeble colony, having such a queen, may easily be reinforced, and soon become a strong stock if it have access to even moderately rich pasturage later in the season.

Not every young queen that is bred becomes fertile. Many are lost on their hymeneal excursions. Colonies to which such have been given should therefore be watched with peculiar care, till we have ocular proof that they contain worker-brood. If a queen be lost, measures should forthwith be taken to remedy the evil, by introducing a reserve queen or a royal cell. But as these are not always at hand, it is advisable to insert a piece of worker-comb, containing eggs and larvæ, in every colony respecting which doubt is entertained. Those who use movable comb hives can greatly aid their young stocks, and guard against this kind of calamity, by the insertion of combs with uncapped worker-larvæ, at intervals of three or four days, until they are satisfied, by actual observation, that the colony contains a queen qualified to lay worker eggs. The bees will always thus have within reach the means of rearing a queen in case of accident; and at this season the uncapped larvæ is not likely to perish from want of heat or due attendance, unless the colony be very feeble.

SUPERSTITION.

In the rural districts of England, it is said to be a prevalent custom among the peasantry, to put their bees in mourning when a death occurs in a family, by affixing crape to each hive. In some sections a still more solemn ceremony is adopted. After the funeral the whole family proceeds to the apiary, and announces its bereavement to the bees in lugubrious tones—tapping the while three times on each hive with the key of the front door. In other sections this practice extends to informing the bees of every important occurrence which may affect the country. The notion is that, if this were not done, the bees would decamp, or gradually decline and perish.

A box 6½ inches high, and 15 inches square, in the clear, will contain 20 lbs. honey in the comb.